

## TOP TEN STUDENT ERRORS ON AP CALCULUS EXAMINATIONS

(Disclaimer: These are the opinion of Dan Kennedy and do not necessarily reflect the opinions of the College Board, the Educational Testing Service, the AP Calculus Test Development Committee, or even the results of sound statistical analysis. If you have taught AP Calculus for a while, however, you know in your heart that he is correct.)

1.  $f''(x) = 0 \Leftrightarrow (x, f(x))$  is a point of inflection.
2.  $f(x)$  is a maximum (minimum)  $\Leftrightarrow f'(x) = 0$ .
3. Average rate of change of  $f$  on  $[a, b]$  is  $\frac{f'(a) + f'(b)}{2}$ .
4. Volume by washers is  $\int_a^b \pi(R - r)^2 dx$ .
5. Separable differential equations can be solved without separating the variables.
6. Omitting the constant of integration, especially in initial value problems.
7. Graders will assume the correct antecedents for all pronouns used in justifications.
8. If the correct answer came from your calculator, the grader will assume your setup was correct.
9. Universal logarithmic antidifferentiation:  $\int \frac{1}{f(x)} dx = \ln|f(x)| + C$ .
10.  $\frac{d}{dx} f(y) = f'(y)$  and other Chain Rule errors.

### List of Problems used

- 1: 1969 MC AB17/BC17, 1997 AB5/BC5 (d), 1995 BC5, 1998 MC AB 19
- 2: 2000 AB4 (d) and 1988 BC1 (c)
- 3: 1997 AB1 (b)
- 4: 1986 AB6/BC3 (b) and 1999 AB2/BC2 (b)&(c)
- 5: 1997 AB6/BC6 (a) and 2000 AB6 (a)
- 6: 2000 AB4 (a,c -- method 2) and 1989 BC1 (a)
- 7: 1996 AB1 (a,b,c)
- 8: 1998 AB5/BC5 (b,c,d)
- 9: 1993 MC AB22
- 10: 1992 AB4/BC1 (c) and 1993 MC AB24